इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

"जानने का अधिकार, जीने का अधिकार"
Mazdoor Kisan Shakti Sangathan
"The Right to Information, The Right to Live"

"पुराने को छोड नये के तरफ"
Jawaharlal Nehru
"Step Out From the Old to the New"

IS 15248 (2002): Self-Centering Chucks for Machine Tools with Two-Piece Jaws (Tongue and Groove Type) - Sizes for Interchangeability and Acceptance Test Specifications [PGD 2: Machine Tool Elements and Holding Devices]

"ज्ञान से एक नये भारत का निर्माण"
Satyanarayan Gangaram Pitroda
"Invent a New India Using Knowledge"

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

"ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है"
Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

IS 15248 : 2002
ISO 3442 : 1991

भारतीय मानक

मशीन टूल्स के लिए दो-पीस जबड़ों वाली स्वत: केन्द्रण वाली चक (टंग व ग्रुव टाईप) — अन्तर्विनिमय-योग्य माप तथा स्वीकरण परीक्षण विशिष्टियाँ

Indian Standard

SELF-CENTRING CHUCKS FOR MACHINE TOOLS WITH TWO-PIECE JAWS (TONGUE AND GROOVE TYPE) — SIZES FOR INTERCHANGEABILITY AND ACCEPTANCE TEST SPECIFICATIONS

ICS 621.9-229.323.2

© BIS 2002

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

November 2002

Price Group 6

Machine Tool Elements and Holding Devices Sectional Committee, BP 02

NATIONAL FOREWORD

This Indian Standard which is identical with ISO 3442:1991 'Self-centring chucks for machine tools with two-piece jaws (tongue and groove type) — Sizes for interchangeability and acceptance test specifications' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendations of the Machine Tool Elements and Holding Devices the Sectional Committee and approval of the Basic and Production Engineering Division Council.

The text of the ISO Standard has been approved as suitable for publication as Indian Standard without deviations. In this adopted standard, certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to the following International Standard for which Indian Standard also exists. The corresponding Indian Standard which is to be substituted in its place is listed below along with its degree of equivalence for the edition indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 230-1:1986[1] Acceptance code for machine tools — Part 1: Geometric accuracy of machines operating under no-load or finishing conditions	IS 2063:1988 Acceptance code for machine tools — Geometric accuracy of machines operating under no load or finishing conditions (*first revision*)	Identical

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2:1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

---

[1] Since revised in 1996.

Indian Standard

SELF-CENTRING CHUCKS FOR MACHINE TOOLS WITH TWO-PIECE JAWS (TONGUE AND GROOVE TYPE) — SIZES FOR INTERCHANGEABILITY AND ACCEPTANCE TEST SPECIFICATIONS

1 Scope

This International Standard specifies the sizes for interchangeability, and describes, with reference to ISO 230-1, the geometrical tests on self-centring chucks with two-piece jaws and the corresponding permissible deviations which apply.

It deals only with the inspection of rotational accuracy of the chuck and the positioning of the assembling elements of top jaws. It does not apply to other dynamic qualities, such as measurement of lack of balance during rotation, balancing or measurement of gripping power.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 230-1:1986, *Acceptance code for machine tools — Part 1: Geometric accuracy of machines operating under no-load or finishing conditions.*

3 Preliminary remarks

3.1 Sizes for interchangeability

Although the internal mounting parts and the fixing screws are not mutually interchangeable, depending on whether they are manufactured in conformity with the metric sizes or the inch sizes, there is direct interchangeability for the same type between the base or master jaws in metric sizes and top jaws in inches, or vice versa.

3.2 Acceptance test specifications

According to the type of chuck under consideration, i.e. hand- or power-operated, the main purpose of these tests is to allow either top jaw mounting compatible with the machining accuracy of the chuck or a precise setting for top jaws on the chuck after carrying out preliminary centring, straightening or locking operations on a jig separate from the machine.

4 Precision classes

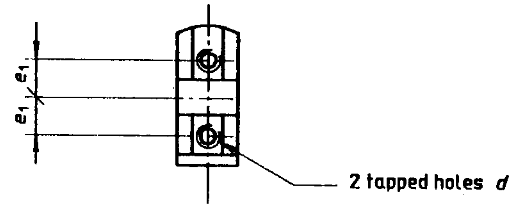
Two precision classes are specified, namely

- class I, corresponding to precision chucks;
- class II, corresponding to normal accuracy chucks.

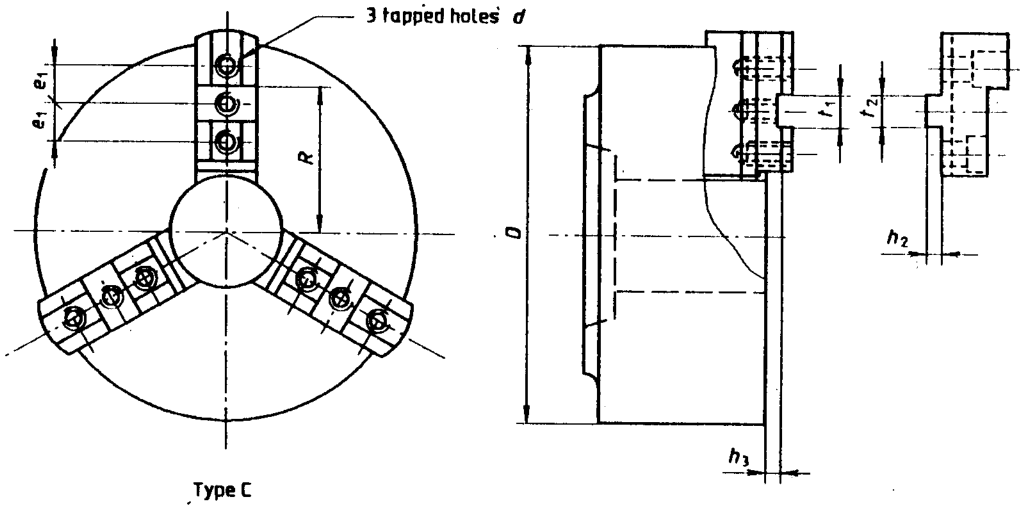
For purposes of information, and particularly concerning class I power-operated chucks, it should be noted that these can be provided, if necessary, with specially adjusted base or master jaws which are not interchangeable with other base or master jaws. In this case, chucks shall be marked.

5 Sizes for interchangeability

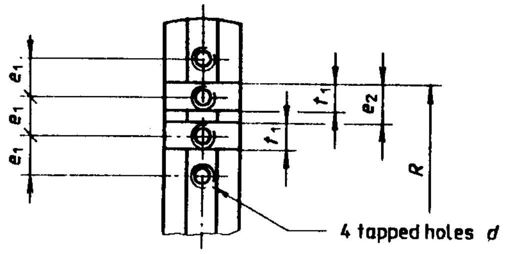
The sizes for interchangeability are shown in figure 1 and are given in 5.1 and 5.2, respectively, for hand-operated chucks and power-operated chucks.

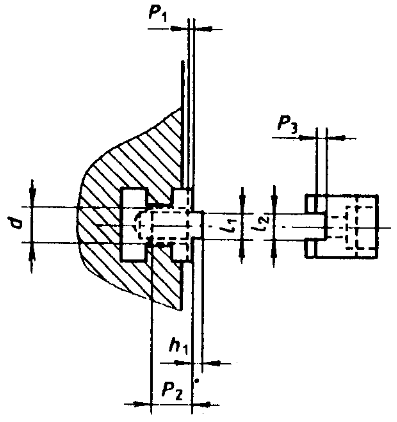


Type B



Type C





Type D

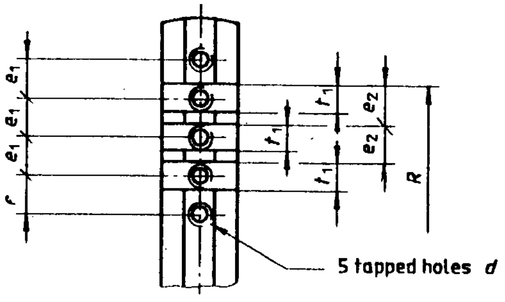


Figure 1

5.1 Hand-operated chucks

The sizes for interchangeability for hand-operated chucks are given in table 1 (metric) and in table 2 (inches).

Table 1

Dimensions in millimetres

Nominal diameter of chuck, D_{nom}	**100**	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1 000**
Type	**A**	**A**	**A**	**A**	**A**	**B**	**B**	**C**	**D**	**D**	**D**
$D \pm 5$ %	100	125	160	200	250	315	400	500	630	800	1 000
Base or master jaw											
d	M6	M8	M10	M10	M12	M12	M16	M20	M20	M20	M20
$e_1 \pm 0{,}15$	9,5	11,1	19	22,2	27	31,75	38,1	38,1	38,1	38,1	38,1
e_2	—	—	—	—	—	—	—	38,1	38,1	38,1	38,1
h_1	2,2	2,2	3	3	3	3	3	3	3	3	3
h_3 min.	4	4	5	5	5	5	8	8	8	8	8
l_1 h9	6,35	6,35	7,94	7,94	12,7	12,7	12,7	12,7	12,7	12,7	12,7
P_1	3,2	3,2	4	4	4	4	7	7	7	7	7
P_2	9	13	18	18	20	20	28	33	33	33	33
t_1 H8	9,525	9,525	12,675	12,675	19,025	19,025	19,025	19,025	19,025	19,025	19,025
Top jaw											
h_2	2,2	2,2	3	3	3	3	6	6	6	6	6
l_2 E9	6,35	6,35	7,94	7,94	12,7	12,7	12,7	12,7	12,7	12,7	12,7
P_3	3,2	3,2	4	4	4	4	4	4	4	4	4
t_2 h8	9,525	9,525	12,675	12,675	19,025	19,025	19,025	19,025	19,025	19,025	19,025

Table 2

Dimensions in inches

Nominal diameter of chuck, D_{nom}		4	5	6	8	10	12	15	18	21	24	28	32	36
Type				A	A	A	B	B	C	D	D	D	D	D
$D \pm 5$ %		4	5	6	8	10	12	15	18	21	24	28	32	36
Base or master jaw														
d		0,250	0,312	0,375	0,375	0,500	0,500	0,625	0,750	0,750	0,750	0,750	0,750	0,750
UNC-3B		−20	−18	−16	−16	−13	−13	−11	−10	−10	−10	−10	−10	−10
$e_1 \pm 0{,}006$		0,375	0,437	0,750	0,875	1,062	1,250	1,500	1,500	1,500	1,500	1,500	1,500	1,500
e_2		—	—	—	—	—	—	—	1,500	1,500	1,500	1,500	1,500	1,500
h_1	max.	0,10	0,10	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14	0,14
	min.	0,08	0,08	0,12	0,12	0,12	0,12	0,12	0,12	0,12	0,12	0,12	0,12	0,12
h_3		0,16	0,16	0,20	0,20	0,20	0,20	0,32	0,32	0,32	0,32	0,32	0,32	0,32
l_1	max.	0,250	0,250	0,312	0,312	0,500	0,500	0,500	0,500	0,500	0,500	0,500	0,500	0,500
	min.	0,248	0,248	0,310	0,310	0,498	0,498	0,498	0,498	0,498	0,498	0,498	0,498	0,498
r_1	max.	0,13	0,13	0,18	0,18	0,18	0,18	0,30	0,30	0,30	0,30	0,30	0,30	0,30
	min.	0,11	0,11	0,16	0,16	0,16	0,16	0,28	0,28	0,28	0,28	0,28	0,28	0,28
r_2		0,35	0,51	0,65	0,65	0,80	0,80	1,10	1,30	1,30	1,30	1,30	1,30	1,30
t_1	max.	0,375	0,375	0,500	0,500	0,750	0,750	0,750	0,750	0,750	0,750	0,750	0,750	0,750
	min.	0,374	0,374	0,499	0,499	0,749	0,749	0,749	0,749	0,749	0,749	0,749	0,749	0,749
Top jaw														
h_2	max.	0,10	0,10	0,12	0,12	0,12	0,12	0,25	0,25	0,25	0,25	0,25	0,25	0,25
	min.	0,08	0,08	0,10	0,10	0,10	0,10	0,23	0,23	0,23	0,23	0,23	0,23	0,23
l_2	max.	0,253	0,253	0,315	0,315	0,503	0,503	0,503	0,503	0,503	0,503	0,503	0,503	0,503
	min.	0,251	0,251	0,313	0,313	0,501	0,501	0,501	0,501	0,501	0,501	0,501	0,501	0,501
r_3	max.	0,13	0,13	0,17	0,17	0,17	0,17	0,17	0,17	0,17	0,17	0,17	0,17	0,17
	min.	0,11	0,11	0,15	0,15	0,15	0,15	0,15	0,15	0,15	0,15	0,15	0,15	0,15
t_2	max.	0,374	0,374	0,499	0,499	0,749	0,749	0,749	0,749	0,749	0,749	0,749	0,749	0,749
	min.	0,373	0,373	0,498	0,498	0,748	0,748	0,748	0,748	0,748	0,748	0,748	0,748	0,748

5.2 Power-operated chucks

The sizes for interchangeability for power-operated chucks are given in table 3 (metric) and in table 4 (inches).

Table 3

Dimensions in millimetres

Nominal diameter of chuck, D_{nom}	**100**	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1 000**
Type			**A**	**A**	**A**	**B**	**B**	**C**	**D**		
$D \pm 5$ %	100	125	160	200	250	315	400	500	630	800	1 000
Base or master jaw											
d			M10	M12	M16	M16	M20	M20	M20		
$e_1 \pm 0,15$			19	22,2	27	31,75	38,1	38,1	38,1		
e_2			—	—	—	—	—	38,1	38,1		
h_1			3	3	3	3	3	3	3		
h_3 min.			5	5	5	5	8	8	8		
l_1 h9			7,94	7,94	12,7	12,7	12,7	12,7	12,7		
P_1			4	4	4	4	7	7	7		
P_2			20	22	27	30	38	38	38		
t_1 H8			12,675	12,675	19,025	19,025	19,025	19,025	19,025		
Top jaw											
h_2			3	3	3	3	6	6	6		
l_2 E9			7,94	7,94	12,7	12,7	12,7	12,7	12,7		
P_3			4	4	4	4	4	4	4		
t_2 h8			12,675	12,675	19,025	19,025	19,025	19,025	19,025		
R			65	76,5	95	118	150	205	265,5		

Table 4

Dimensions in inches

Nominal diameter of chuck, D_{nom}		4	5	6	8	10	12	15	18	21	24	28	32	36
Type				A	A	A	B	B	C	D	D	D	D	D
$D \pm 5$ %		4	5	6	8	10	12	15	18	21	24	28	32	36
Base or master jaw														
d				0,437 5	0,500	0,625	0,625	0,750	0,750	0,750	0,750	0,875	0,875	0,875
UNC-3B				– 14	– 13	– 11	– 11	– 10	– 10	– 10	– 10	– 9	– 9	– 9
$e_1 \pm 0,006$				0,750	0,875	1,062	1,250	1,500	1,500	1,500	1,500	1,500	1,500	1,500
e_2				—	—	—	—	—	1,500	1,500	1,500	1,500	1,500	1,500
h_1	max.			0,12	0,12	0,12	0,12	0,12	0,12	0,12	0,12	0,12	0,12	0,12
	min.			0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10	0,10
h_3				0,20	0,20	0,20	0,20	0,32	0,32	0,32	0,32	0,32	0,32	0,32
l_1	max.			0,312	0,312	0,500	0,500	0,500	0,500	0,500	0,500	0,500	0,500	0,500
	min.			0,310	0,310	0,498	0,498	0,498	0,498	0,498	0,498	0,498	0,498	0,498
P_1	max.			0,17	0,17	0,17	0,17	0,30	0,30	0,30	0,30	0,30	0,30	0,30
	min.			0,15	0,15	0,15	0,15	0,28	0,28	0,28	0,28	0,28	0,28	0,28
P_2				0,76	0,88	1,06	1,20	1,50	1,50	1,50	1,50	1,50	1,50	1,50
t_1	max.			0,500	0,500	0,750	0,750	0,750	0,750	0,750	0,750	0,750	0,750	0,750
	min.			0,499	0,499	0,749	0,749	0,749	0,749	0,749	0,749	0,749	0,749	0,749
Top jaw														
h_2	max.			0,12	0,12	0,12	0,12	0,25	0,25	0,25	0,25	0,25	0,25	0,25
	min.			0,10	0,10	0,10	0,10	0,23	0,23	0,23	0,23	0,23	0,23	0,23
l_2	max.			0,315	0,315	0,503	0,503	0,503	0,503	0,503	0,503	0,503	0,503	0,503
	min.			0,313	0,313	0,501	0,501	0,501	0,501	0,501	0,501	0,501	0,501	0,501
P_3	max.			0,17	0,17	0,17	0,17	0,17	0,17	0,17	0,17	0,17	0,17	0,17
	min.			0,15	0,15	0,15	0,15	0,15	0,15	0,15	0,15	0,15	0.15	0,15
t_2	max.			0,499	0,499	0,749	0,749	0,749	0,749	0,749	0,749	0,749	0,749	0,749
	min.			0,498	0,498	0,748	0,748	0,748	0,748	0,748	0,748	0,748	0,748	0,748
R				2,44	3,06	3,81	4,50	5,62	7,12	8,62	10,12	12,12	14,12	16,12

6 Acceptance test specifications (Geometrical tests)

6.1 Class I

See figure 2 and table 5.

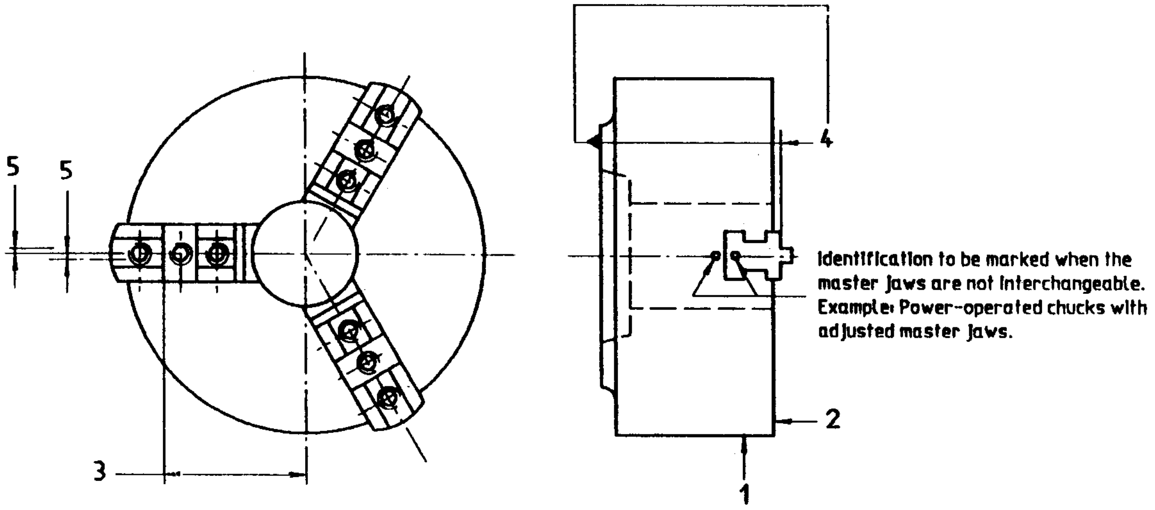

5
5
3
4
2
1
Identification to be marked when the master jaws are not interchangeable. Example: Power-operated chucks with adjusted master jaws.

Figure 2

Table 5

No.	**Object**	**Nominal diameter of chuck** D_{nom}		**Full indicator movement (FIM) (nos. 1, 2, 3 and 4) or permissible deviation (no. 5)**			
				Hand-operated chuck		**Power-operated chuck**	
		mm	in	mm	in	mm	in
1	Concentricity of outside diameter	$D_{nom} \leqslant 160$ $160 < D_{nom} \leqslant 315$ $315 < D_{nom} \leqslant 630$ $630 < D_{nom} \leqslant 1\,000$	$D_{nom} \leqslant 6$ $6 < D_{nom} \leqslant 12$ $12 < D_{nom} \leqslant 24$ $24 < D_{nom} \leqslant 36$	0,05 0,08 0,10 0,12	0,002 0,003 0,004 0,005	0,04 0,05 0,06	0,001 5 0,002 0,002 5
2	Axial run-out of face of chuck						
3	Concentricity of outer surface of top jaw locating key slot	$D_{nom} \leqslant 160$ $160 < D_{nom} \leqslant 315$ $315 < D_{nom} \leqslant 630$ $630 < D_{nom} \leqslant 1\,000$	$D_{nom} \leqslant 6$ $6 < D_{nom} \leqslant 12$ $12 < D_{nom} \leqslant 24$ $24 < D_{nom} \leqslant 36$	0,12 0,16 0,20 0,25	0,005 0,006 0,008 0,01	0,025 0,04 0,05	0,001 0,001 5 0,002
4	Deviation of dimension between top of master jaws and mounting face of chuck	$D_{nom} \leqslant 160$ $160 < D_{nom} \leqslant 315$ $315 < D_{nom} \leqslant 630$ $630 < D_{nom} \leqslant 1\,000$	$D_{nom} \leqslant 6$ $6 < D_{nom} \leqslant 12$ $12 < D_{nom} \leqslant 24$ $24 < D_{nom} \leqslant 36$	0,10 0,12 0,16 0,20	0,004 0,005 0,006 0,008	0,025 0,04 0,05	0,001 0,001 5 0,002
5	Permissible deviation between top jaw locating centre-line and parallel plane through centre-line of chuck	$D_{nom} \leqslant 160$ $160 < D_{nom} \leqslant 315$ $315 < D_{nom} \leqslant 630$ $630 < D_{nom} \leqslant 1\,000$	$D_{nom} \leqslant 6$ $6 < D_{nom} \leqslant 12$ $12 < D_{nom} \leqslant 24$ $24 < D_{nom} \leqslant 36$	0,12 0,16 0,20 0,25	0,005 0,006 0,008 0,01	0,05 0,08 0,1	0,002 0,003 0,004

NOTES

1 For the purposes of geometrical tests nos. 1, 3 and 5, the chuck may be mounted on a test spindle flange or adaptor. The radial run-out on the outside diameter of the flange or adaptor and the axial run-out at any point on its face shall be not more than 0,005 mm or 0,000 2 in FIM.

2 Geometrical tests nos. 3, 4 and 5 shall be carried out with the chuck tightened, the base or master jaws locked on a dummy piece. The value of the clamping force shall be specified by the manufacturer.

3 Where interchangeability of base jaws is required, the tolerances applied to class I power-operated chucks (test no. 3) will have to be increased considerably.

6.2 Class II

See figure 3 and table 6.

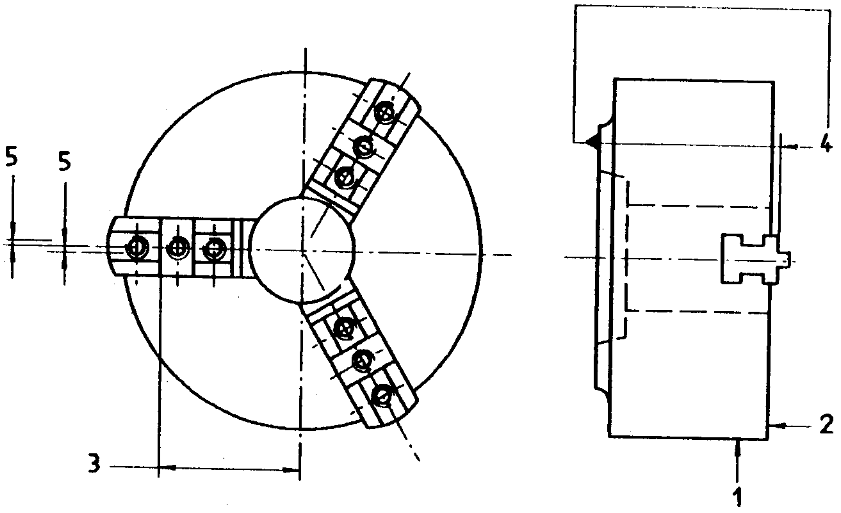


Figure 3

Table 6

No.	Object	Nominal diameter of chuck		Full indicator movement (FIM) (nos. 1, 2, 3 and 4) or permissible deviation (no. 5)			
				Hand-operated chuck		Power-operated chuck	
		mm	in	mm	in	mm	in
1	Concentricity of outside diameter	$D_{nom} \leqslant 160$	$D_{nom} \leqslant 6$	0,05	0,002	0,05	0,002
2	Axial run-out of face of chuck	$160 < D_{nom} \leqslant 315$	$6 < D_{nom} \leqslant 12$	0,08	0,003	0,08	0,003
		$315 < D_{nom} \leqslant 630$	$12 < D_{nom} \leqslant 24$	0,10	0,004	0,10	0,004
		$630 < D_{nom} \leqslant 1\,000$	$24 < D_{nom} \leqslant 36$	0,12	0,005		
3	Concentricity of outer surface of top jaw locating key slot	$D_{nom} \leqslant 160$	$D_{nom} \leqslant 6$	0,25	0,01	0,12	0,005
		$160 < D_{nom} \leqslant 315$	$6 < D_{nom} \leqslant 12$	0,3	0,012	0,16	0,006
		$315 < D_{nom} \leqslant 630$	$12 < D_{nom} \leqslant 24$	0,4	0,015	0,20	0,008
		$630 < D_{nom} \leqslant 1\,000$	$24 < D_{nom} \leqslant 36$	0,5	0,02		
4	Deviation of dimension between top of master jaws and mounting face of chuck	$D_{nom} \leqslant 160$	$D_{nom} \leqslant 6$	0,2	0,008	0,08	0,003
		$160 < D_{nom} \leqslant 315$	$6 < D_{nom} \leqslant 12$	0,25	0,01	0,10	0,004
		$315 < D_{nom} \leqslant 630$	$12 < D_{nom} \leqslant 24$	0,3	0,012	0,12	0,005
		$630 < D_{nom} \leqslant 1\,000$	$24 < D_{nom} \leqslant 36$	0,4	0,015		
5	Permissible deviation between top jaw locating centre-line and parallel plane through centre-line of chuck	$D_{nom} \leqslant 160$	$D_{nom} \leqslant 6$	0,25	0,01	0,12	0,005
		$160 < D_{nom} \leqslant 315$	$6 < D_{nom} \leqslant 12$	0,3	0,012	0,16	0,006
		$315 < D_{nom} \leqslant 630$	$12 < D_{nom} \leqslant 24$	0,4	0,015	0,2	0,008
		$630 < D_{nom} \leqslant 1\,000$	$24 < D_{nom} \leqslant 36$	0,5	0,02		

NOTES

1 For the purposes of geometrical tests nos. 1, 3 and 5, the chuck may be mounted on a test spindle flange or adaptor. The radial run-out on the outside diameter of the flange or adaptor and the axial run-out at any point on its face shall be not more than 0,005 mm or 0,000 2 in FIM.

2 Geometrical tests nos. 3, 4 and 5 shall be carried out with the chuck tightened, the base or master jaws locked on a dummy piece. The value of the clamping force shall be specified by the manufacturer.

3 Where interchangeability of base jaws is required, the tolerances applied to all class II chucks (test no. 3) will have to be increased by 50 %.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act,* 1986 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reprodued in any form without the prior permission in writing from BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright may be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc : No. BP 02 (0280).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110 002
Telephones : 323 01 31, 323 33 75, 323 94 02

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :

		Telephone
Central	: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110 002	323 76 17 323 38 41
Eastern	: 1/14 C.I.T. Scheme VI M, V. I. P. Road, Kankurgachi KOLKATA 700 054	337 84 99, 337 85 61 337 86 26, 337 91 20
Northern	: SCO 335-336, Sector 34-A, CHANDIGARH 160 022	60 38 43 60 20 25
Southern	: C.I.T. Campus, IV Cross Road, CHENNAI 600 113	254 12 16, 254 14 42 254 25 19, 254 13 15
Western	: Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400 093	832 92 95, 832 78 58 832 78 91, 832 78 92

Branches : AHMEDABAD. BANGALORE. BHOPAL. BHUBANESHWAR. COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD. JAIPUR. KANPUR. LUCKNOW. NAGPUR. NALAGARH. PATNA. PUNE. RAJKOT. THIRUVANANTHAPURAM. VISAKHAPATNAM.

Printed by Dee Kay Printers.